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SWAN LAKE

INTRODUCTION

Swan Lake is located about 16 miles northeast of Petersburg. A trail extends from tidewater at Thomas Bay to the outlet of Swan Lake. The only other feature of human origin in the basin is a streamgaging station on the lower reaches of Cascade Creek, the outlet stream. This station is maintained by the U.S. Geological Survey. The water supply for this system is largely precipitation although the inlet streams entering near the head of the lake discharge small amounts of glacial flour material.

Swan Lake has been periodically considered down through the years as a site for hydroelectric development. The most recent proposal at this site is that of the City of Petersburg, Alaska (Federal Power Commission project number 2521). This proposal would provide for a tidewater powerhouse and a four stage development. Initially no dam would be utilized; however, the second stage would include a dam at Swan Lake and the fourth stage would provide for power development of the head between Swan Lake and Falls Lake by construction of a second powerhouse (at Falls Lake). The ultimate capacity of this proposed project would be 38,000 kilowatts and this block of power would be utilized in the municipal system of Petersburg and in an anticipated future expansion of local timber industries.

LAKE

Swan Lake (figure_____) possesses depths in excess of 500 feet. Its waters are cold, clear, and slightly colored gray-green by glacial flour. The surrounding basin is extremely precipitous and peaks rising above 5,000 feet

occur within two miles of the lake margins. The lake and its mountainous setting are extremely scenic.

Aquatic vegetation is absent on Swan Lake.

Figures _____ through _____ present limnological observations on Swan Lake. This series, particularly during 1961, forms one of the few time series within a single year accomplished during the survey work reported on in this paper. The four observations for station number 1 during 1961 show clearly the temperature regime before, during, and after the summer maximum. By October, the lake is approaching constant temperature from surface to bottom, and complete circulation of the lake waters is indicated by replenishment of deep water oxygen. Variation in the temperature profile between years can be observed by comparison of the August 10, 1961 observation with the August 9, 1962 observation, both for station number 1. The two 1961 observations for station number 2, near the lake outlet, show considerable cooling within the one-month period. Although secchi disk readings are missing for some of these observations, the ones available in the series tend to show a lessening of transparency as the year progresses. This is probably the effect of increasing amounts of glacial flour accumulating in the surface layers of the lake with the progression of summer melting.

STREAMS

The outlet stream, Cascade Creek, possesses a very steep gradient and coarse bottom materials. It descends from the 1,487 foot/elevation of Swan Lake to tidewater in a distance of 2.5 miles, passing through Falls Lake, a 20-acre body of water lying at the 1,100-foot elevation. A falls near tidewater on Cascade Creek

blocks the migration of anadromous fish into the basin. The mean discharge of Cascade Creek, as measured at the U.S. Geological Survey's gaging station one-quarter mile upstream from the creek mouth, is 251 c.f.s.

Lateral tributaries to the lake are steep and turbulent. A single exception is the lateral inlet entering the lake near its upper end; this stream possesses a section of lesser gradient in its lowermost reaches. The largest tributary of the lake also enters at the lake's upper end. This tributary originates on the steep western slopes of the coast range only 5 miles from Swan Lake. It is swift and turbulent throughout most of its length, but the 1.2 mile lowermost section of this tributary has a gentle gradient and possesses gravel suitable for fish spawning. A 35-foot waterfall precludes fish migration beyond this 1.2 mile section.

FISH POPULATIONS

As a result of plantings during 1957 and 1959, Swan Lake contains a thriving population of rainbow trout. Gillnet catches are summarized in figure _____, and figure _____ presents the length frequency of the fish taken. Sportfishing pressure in the Cascade Creek basin is at present light, owing to the difficulty of reaching the lake. A few anglers fly in to Swan Lake with light float-equipped aircraft. Fewer still hike into the lake over the Forest Service trail.

The rainbow trout population now present in Swan Lake has extended downstream throughout the length of Cascade Creek and into Falls Lake. Anadromous fish cannot migrate into Cascade Creek owing to the falls located just above the high tide line. Trout have been seen in the major inlet stream entering at the head of the lake, and this creek is believed to be of significance

in spawning of the lake resident trout population.